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Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force **DATE:** February 2012

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>				PE 0207412F: <i>Modular Control System</i>							
COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
Total Program Element	52.120	3.387	8.653	-	8.653	7.029	0.562	0.578	0.586	Continuing	Continuing
67485L: <i>Theater Air Control System Imp (TACSI)</i>	9.363	3.387	8.653	-	8.653	7.029	0.562	0.578	0.586	Continuing	Continuing
675294: <i>Theater Air Control System Improvement - Radar (TACSI-R)</i>	42.757	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

In FY 2012, Project 5294, Theater Control System Improvement-Radar (TACSI-R) efforts transferred to PE 0604283F, Battle Management Command & Control (BMC2) Sensor Development, Project 6002, Three Dimensional Expeditionary Long Range Radar in order to provide this pre-Major Defense Acquisition Program its own Program Element.

A. Mission Description and Budget Item Justification

This budget activity funds development of mobile ground-based command and control (C2) capabilities of the Control and Reporting Center (CRC) program. The CRC is identified as a component of the Integrated Air Missile Defense Family of Systems that defends the Homeland and US national interests at home and abroad by negating an adversary's ability to achieve adverse effects from their air and missile capabilities. The CRC mission is to provide battlespace awareness and tactical battle management command and control (BMC2) in an assigned area. It is a ground-based theater air control system (TACS) surveillance and BMC2 element. It consists of facilities, equipment, and people and is a tailorable, modular, transportable, sustainable and persistent weapon system employed at the tactical level to support air and surface operations. Currently, the CRCs are fully employed in Operations ENDURING FREEDOM and NOBLE EAGLE. The CRC projects include development and modernization of Theater Air Control Systems Improvement (TACSI) capabilities and the Three-Dimensional Expeditionary Long-Range Radar (3DELRR).

TACSI efforts include, but are not limited to the AN/TYQ-23 Operations Module (OM), AN/TPS-75 Long-Range Surveillance Radar and the AN/TRC-215 Remote Radio Secure Voice System (RRSVS) that may be tasked across the full range of military operations. AN/TYQ-23 OM is a low source/high demand (LS/HD) deployable ground-based C2 asset. This automated, computer-based information system provides operators the real-time battlespace visualization necessary to plan, direct, and control tactical air operations and airspace management tasks. AN/TRC-215 RRSVS is a mobile, vehicle-mounted voice radio and OM-interface unit. The RRSVS allows real-time, secure voice communication between aircraft operating in the battlespace and ground-based BMC2 operators located in the OM of the CRC. The AN/TRC-215 is typically deployed to a remote area which can extend the CRCs radio coverage beyond line of sight (BLOS) using organic SATCOM capabilities.

The 3DELRR program is developing a replacement for the current legacy AN/TPS-75 radar. 3DELRR will be the principal USAF long-range, ground-based sensor for detecting, identifying, tracking, and reporting aircraft and missiles in support of the Joint Forces Air Component Commander (JFACC) through the Ground Theater Air Control System (GTACS). The primary mission of the 3DELRR will be to provide long-range surveillance, control of aircraft, theater ballistic missile detection and Combat Identification (CID). The 3DELRR will respond to the operational need to detect and report highly maneuverable, small radar cross section targets to

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0207412F: <i>Modular Control System</i>
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enable battlespace awareness while at the same time mitigating the reliability, maintainability, and sustainability issues plaguing the AN/TPS-75 radar system. Ongoing planning and associated activities will take place to prevent and overcome diminishing manufacturing sources and obsolescence issues as required.

Activities also include studies and analysis to support both current program planning and execution, as well as future program planning.

This program is in Budget Activity 7, Operational System Development, these budget activities include development efforts to upgrade systems currently fielded or has approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary (\$ in Millions)	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013 Base</u>	<u>FY 2013 OCO</u>	<u>FY 2013 Total</u>
Previous President's Budget	58.313	3.954	7.212	-	7.212
Current President's Budget	52.120	3.387	8.653	-	8.653
Total Adjustments	-6.193	-0.567	1.441	-	1.441
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.055	-			
• SBIR/STTR Transfer	-3.618	-			
• Other Adjustments	-1.520	-0.567	1.441	-	1.441

Change Summary Explanation

Funding change in FY13 is due to increase for C2 engine modification, increase for inflation rates-nonpay, nonfuel, and decrease due to termination of TPS-75 Mode 5 for Control and Reporting Center.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2013 Air Force									DATE: February 2012		
APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 7: Operational Systems Development				R-1 ITEM NOMENCLATURE PE 0207412F: Modular Control System				PROJECT 67485L: Theater Air Control System Imp (TACSI)			
COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
67485L: Theater Air Control System Imp (TACSI)	9.363	3.387	8.653	-	8.653	7.029	0.562	0.578	0.586	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Control and Reporting Center (CRC) program element provides development and modernization of mobile ground-based command and control (C2) capabilities. The CRC is a ground-based theater air control system (TACS) surveillance and battle management command and control (BMC2) element. It consists of facilities, equipment, and people. It is a tailorable, modular, transportable, sustainable, and persistent weapon system employed at the tactical level to support air and surface operations. The CRC projects include development of Theater Air Control Systems Improvement (TACSI) capabilities and the Three-Dimensional Expeditionary Long-Range Radar (3DELRR). Currently USAF CRCs are fully employed in Operations NEW DAWN, ENDURING FREEDOM, and NOBLE EAGLE. The TACSI project develops and modernizes software and hardware to make the CRC a viable BMC2 element. These efforts include, but are not limited to, the development and modernization of the AN/TYQ-23 Operations Module (OM) and the AN/TRC-215 Remote Radio Secure Voice System (RRSVS).

AN/TYQ-23 OM is a low source/high demand (LS/HD) rapidly deployable ground-based C2 asset. This automated, computer-based information system provides operators the real-time battlespace picture necessary to plan, direct, and control tactical air operations and airspace management tasks. AN/TRC-215 RRSVS is a mobile, vehicle-mounted voice radio and OM-interface unit. The RRSVS allows real-time, secure voice communication between aircraft operating in the battlespace and ground-based battle management C2 operators located in the OM of the CRC.

OMs and RRSVS units are currently deployed world-wide in support of ongoing operations. Service Life Extension Program (SLEP) efforts to provide capability upgrades/improvements such as associated Mode 5 passive and/or active Identify Friend or Foe (IFF), and C2 Engine Upgrade are being developed for the CRC. Beginning in FY13, activities will include, but not be limited to, studies, analysis, design and prototype, documentation, testing, and production to support both current program planning and execution and future program planning. This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Title: Continue upgrades to CRC	7.664	2.042	7.202	-	7.202
Description: Continue upgrades to CRC to include advanced planning, Modular Control System (MCS) upgrades, enhanced radio/radar/data link remoting, integrating upgrades into CRC; C2 Engine Upgrade; and AN/TPS-75 sensor replacement/upgrade.					

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 7: Operational Systems Development		R-1 ITEM NOMENCLATURE PE 0207412F: Modular Control System		PROJECT 67485L: Theater Air Control System Imp (TACSI)		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
FY 2011 Accomplishments: Performed development & delivery of software upgrades to RRSVS to include designs for the next increment of RRSVS & redesign of the remote control terminal and server software to operate on a Linux based operating system; performed development & delivery of AN/TYQ-23 V5 SLEP Prototype and redline drawing package. FY 2012 Plans: Performing development & delivery of software upgrades to RRSVS to include, but not limited to, develop designs for next increment of RRSVS; and will begin initial development of C2 Engine Upgrade. FY 2013 Base Plans: Will perform development & delivery of software upgrades to RRSVS to include, but not limited to, develop designs for next increment of RRSVS; and will begin initial development of C2 Engine Upgrade. FY 2013 OCO Plans: N/A						
Title: Test Planning Description: Continue test and evaluation support FY 2011 Accomplishments: Performed test and evaluation, including prototype and feasibility testing of changes associated with new radios and transport technology upgrades for RRSVS; Performed test activities for AN/TYQ-23 V5 SLEP Prototype. FY 2012 Plans: Performing test and evaluation to include, but not be limited to, testing changes of new radios and transport technology upgrades for RRSVS; test activities for radio interface with TYQ-23, and AN/TYQ-23 V5 SLEP. FY 2013 Base Plans: Will perform test and evaluation to include, but not limited to, prototype and feasibility testing of changes associated with new radios and transport technology upgrades for RRSVS, and C2 Engine Upgrade. FY 2013 OCO Plans: N/A		0.944	0.485	0.900	-	0.900
Title: Sys Eng/Tech Support Description: Continue Systems Engineering/Technical Support		0.672	0.790	0.504	-	0.504

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)							FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
FY 2011 Accomplishments: Performed Systems Engineering/Technical Support.											
FY 2012 Plans: Performing Systems Engineering/Technical Support.											
FY 2013 Base Plans: Will perform Systems Engineering/Technical Support.											
FY 2013 OCO Plans: N/A											
Title: Program Management and Administration							0.083	0.070	0.047	-	0.047
Description: Continue Management Services											
FY 2011 Accomplishments: Continued Management Services											
FY 2012 Plans: Continuing Management Services											
FY 2013 Base Plans: Will continue Management Services											
FY 2013 OCO Plans: N/A											
Accomplishments/Planned Programs Subtotals							9.363	3.387	8.653	-	8.653
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
• PE 0207412F: Control and Reporting Center, (OPAF)	20.118	22.740	23.483	0.000	23.483	30.585	33.390	17.375	10.466	Continuing	Continuing

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0207412F: <i>Modular Control System</i>	PROJECT 67485L: <i>Theater Air Control System Imp (TACSI)</i>
D. Acquisition Strategy The CRC program is utilizing evolutionary development to modernize and further advance current and future battlespace awareness and tactical BMC2 capabilities. A variety of contract types will be utilized depending on type of effort. Contracting strategy will include but is not limited to open competition, sole source contracts, and interdepartmental purchase requests.		
E. Performance Metrics Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.		

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Air Force		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0207412F: <i>Modular Control System</i>	PROJECT 67485L: <i>Theater Air Control System Imp (TACSI)</i>

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Air Force			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0207412F: <i>Modular Control System</i>	PROJECT 67485L: <i>Theater Air Control System Imp (TACSI)</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TPS-75 SLEP Design/Development	1	2011	1	2012
TPS-75 SLEP Developmental/Operational Testing	1	2012	1	2013
TPS-75 SLEP Production/Fielding	1	2013	3	2016
Remote Radio Spiral 3.1 Design/Development/Test	1	2011	2	2011
Remote Radio Spiral 3.1 Updates Fielding	4	2011	4	2012
Remote Radio Spiral 3.2 Concept/Design/Development	1	2011	3	2012
Remote Radio Spiral 3.2 Developmental Testing	4	2012	4	2012
Remote Radio Spiral 3.2 Fielding	3	2013	4	2016
OM v(5) SLEP PDR	1	2011	1	2011
OM v(5) SLEP CDR	2	2011	2	2011
OM v(5) SLEP Developmental/Operational Testing	1	2012	2	2012
C2 Engine Upgrade Design/Development	2	2012	2	2014
C2 Engine Upgrade Developmental/Operational Testing	1	2014	1	2015
C2 Engine Upgrade Production/Fielding	1	2015	4	2017

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 3600: Research, Development, Test & Evaluation, Air Force BA 7: Operational Systems Development				R-1 ITEM NOMENCLATURE PE 0207412F: Modular Control System				PROJECT 675294: Theater Air Control System Improvement - Radar (TACSI-R)			
COST (\$ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
675294: Theater Air Control System Improvement - Radar (TACSI-R)	42.757	-	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

Note

In FY 2012, Project 5294, Theater Control System Improvement-Radar (TACSI-R) efforts transferred to PE 0604283F, Battle Management Command & Control (BMC2) Sensor Development, Project 6002, Three Dimensional Expeditionary Long Range Radar in order to provide this pre-Major Defense Acquisition Program its own Program Element.

A. Mission Description and Budget Item Justification

The Three-Dimensional Expeditionary Long-Range Radar (3DELRR) program is developing a replacement for the current legacy AN/TPS-75 radar. 3DELRR will be the principal USAF long-range, ground-based sensor for detecting, identifying, tracking, and reporting aircraft and missiles in support of the Joint Forces Air Component Commander (JFACC) through the Ground Theater Air Control System (GTACS). The primary mission of the 3DELRR will be to provide long-range surveillance, control of aircraft, and theater ballistic missile detection and Combat Identification (CID). The 3DELRR will respond to the operational need to detect and report highly maneuverable, small radar cross section targets to enable battlespace awareness while at the same time mitigating the reliability, maintainability, and sustainability issues plaguing the AN/TPS-75 radar system.

3DELRR will provide air controllers with a precise, real-time air picture of sufficient quality to conduct close control of individual aircraft under a wide range of environmental and operational conditions. In the case of theater missile defense operations, the 3DELRR will have the capability to detect, track, and disseminate target information to respective command and control nodes such as the Control and Reporting Center (CRC) to disseminate for warning and engagement. Similarly, the joint targeting process will benefit from trajectory information provided by the 3DELRR, which will include launch and impact location.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Title: Technology Development (TD) and Program Definition and Risk Reduction (PDRR)	35.445	-	-	-	-
Description: Technology development (TD) phase and Program Definition and Risk Reduction (PDRR) efforts associated with delivering a new long-range, ground-based sensor.					
FY 2011 Accomplishments: Continued the Technology Development (TD) Phase and risk reduction efforts of 3DELRR. Activities included demonstration of Critical Technology Elements (CTEs) to Technology Readiness Level (TRL) 6, design options analyses, requirements refinement, identification and analyses of existing and emerging system threats,					

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
(including cyber warfare). Results were captured in appropriate technical requirements, life-cycle cost estimate revision, test planning, and Milestone B documentation development. Planned for PDRR activities including, but not limited to, a full and open competition, design development, development of system functional modeling and simulation, and execution of the program protection plan. FY 2012 Plans: N/A FY 2013 Base Plans: N/A FY 2013 OCO Plans: N/A						
Title: Test and Evaluation Support Description: Continue Program Support (i.e., travel, supplies, equipment, miscellaneous) FY 2011 Accomplishments: Conducted test and evaluation to include, but not limited to, development of the test strategy and test-related documentation, planning of future developmental test and evaluation events, information assurance planning, and participation in technical and test-related working groups. FY 2012 Plans: N/A FY 2013 Base Plans: N/A FY 2013 OCO Plans: N/A		0.241	-	-	-	-
Title: Systems Engineering/Technical Support Description: Continue Systems Engineering/Technical Support FY 2011 Accomplishments: Continued Systems Engineering/Technical Support FY 2012 Plans:		6.576	-	-	-	-

UNCLASSIFIED

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B. Accomplishments/Planned Programs (\$ in Millions)								FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
N/A												
FY 2013 Base Plans: N/A												
FY 2013 OCO Plans: N/A												
Title: Management Services								0.495	-	-	-	-
Description: Program Management and Administration												
FY 2011 Accomplishments: Provided management and administrative services support.												
FY 2012 Plans: N/A												
FY 2013 Base Plans: N/A												
FY 2013 OCO Plans: N/A												
Accomplishments/Planned Programs Subtotals								42.757	-	-	-	-
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost	
• PE 0604283F: Battle Management Command & Control	11.939	30.362	114.417	0.000	114.417	0.000	0.000	0.000	0.000	Continuing	Continuing	
• PE 0207455F: Three Dimensional Expeditionary Long Range Radar	0.000	0.000	0.000	0.000	0.000	70.160	69.533	89.985	54.000	Continuing	Continuing	
• WSC 833040: Theater Air Control System Improvement	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.644	Continuing	Continuing	

UNCLASSIFIED

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D. Acquisition Strategy

PE 0604283F, Three-Dimensional Expeditionary Long-Range Radar (3DELRR), is providing full capability via full and open competition to further advance C2 capabilities supporting battlefield command and control.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

UNCLASSIFIED

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UNCLASSIFIED

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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
3DELRR On-going Risk Reduction	1	2011	4	2011
3DELRR On-going System Development	1	2011	4	2011
3DELRR TD Phase Capability Demo B	1	2011	1	2011